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EP 0223529 A2 WO 90/09655 A1 US 4034164 A
US 3978524 A US 3946156 A

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(54) Intercom adaptor for in-car audio system

(57) The adaptor enables an audio system 2 to be used as a communication system and comprises a microphone 3; an electronic circuit 4; a power connection 5 and connector means 1 for connecting an output of the electronic circuit to an input of an audio system 2 so that sound picked-up by the microphone 3 is transmitted through the speakers of the audio system 2. The adaptor is of particular use within a vehicle to enable those in the front of the vehicle to talk to those in the back via the vehicle's existing audio system.

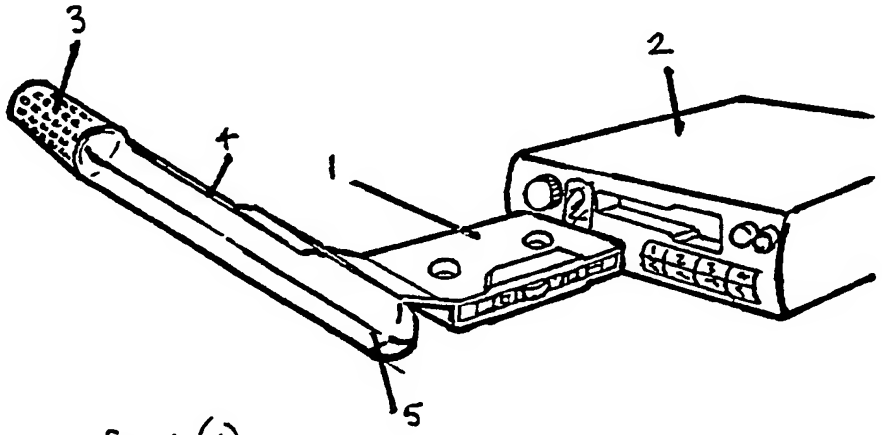

FIG 1 (A)

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At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

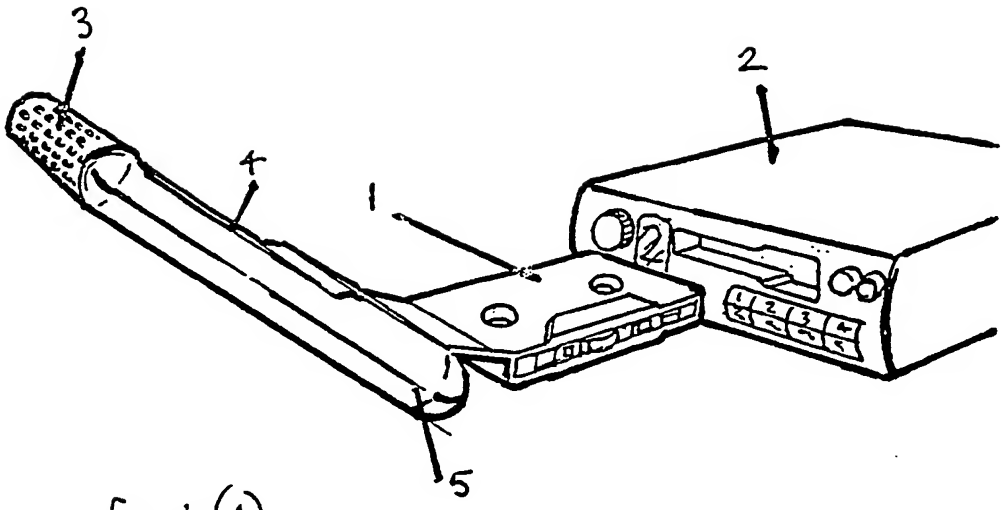

FIG 1 (A)

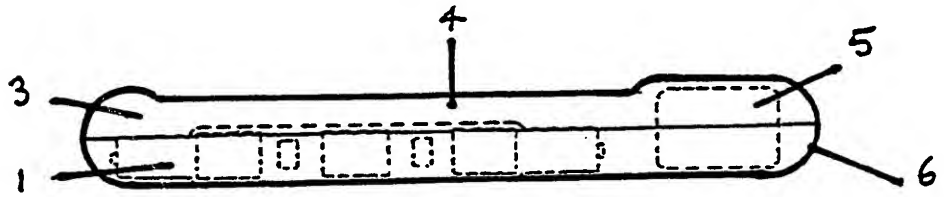

FIG 1 (B)

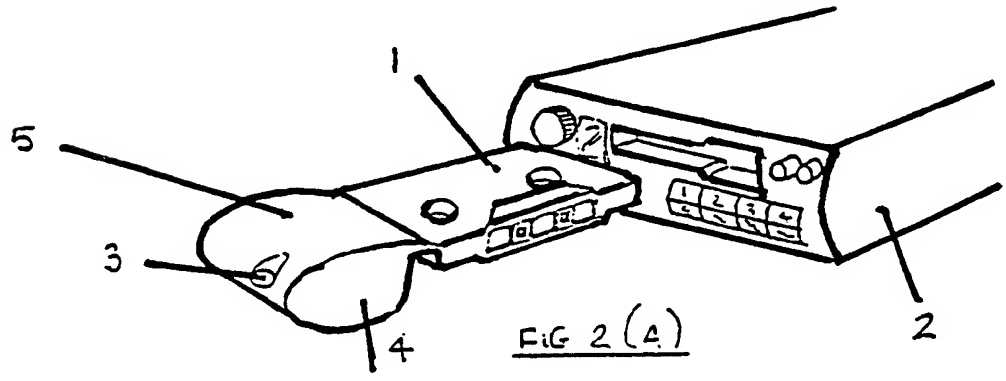

FIG 2 (A)

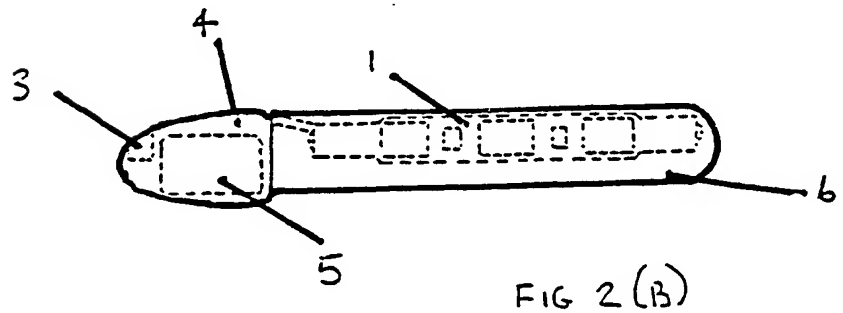

FIG 2 (B)

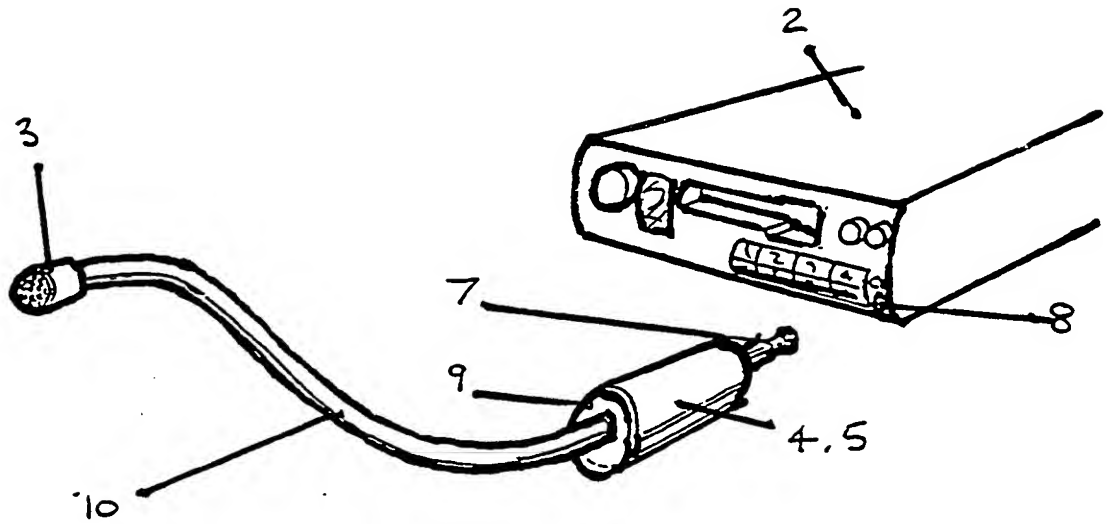

FIG 3

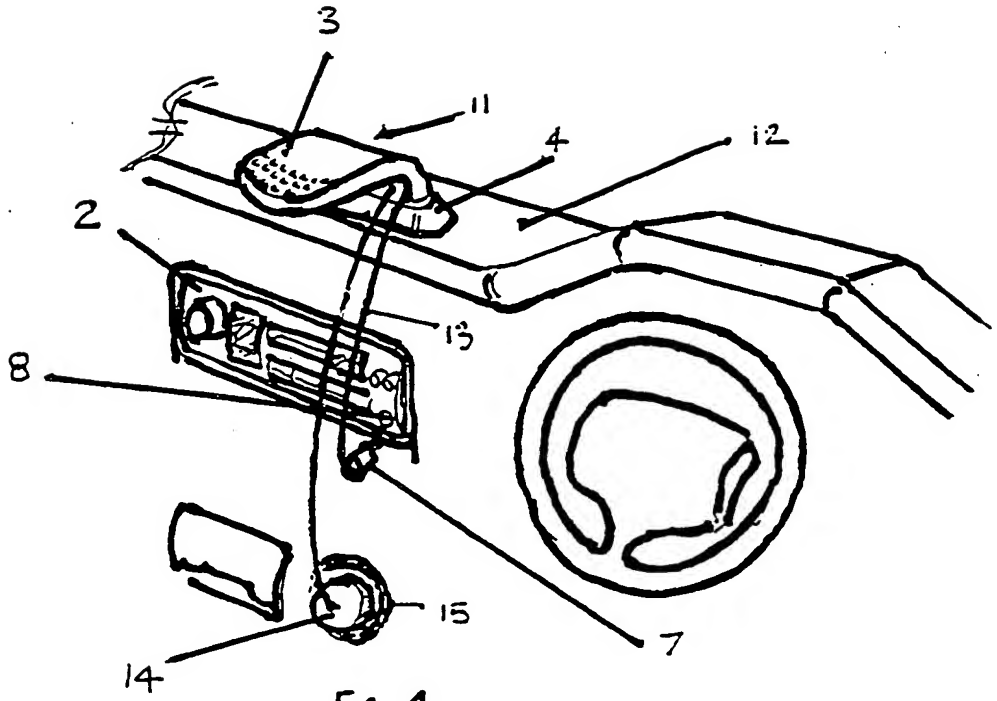

FIG 4

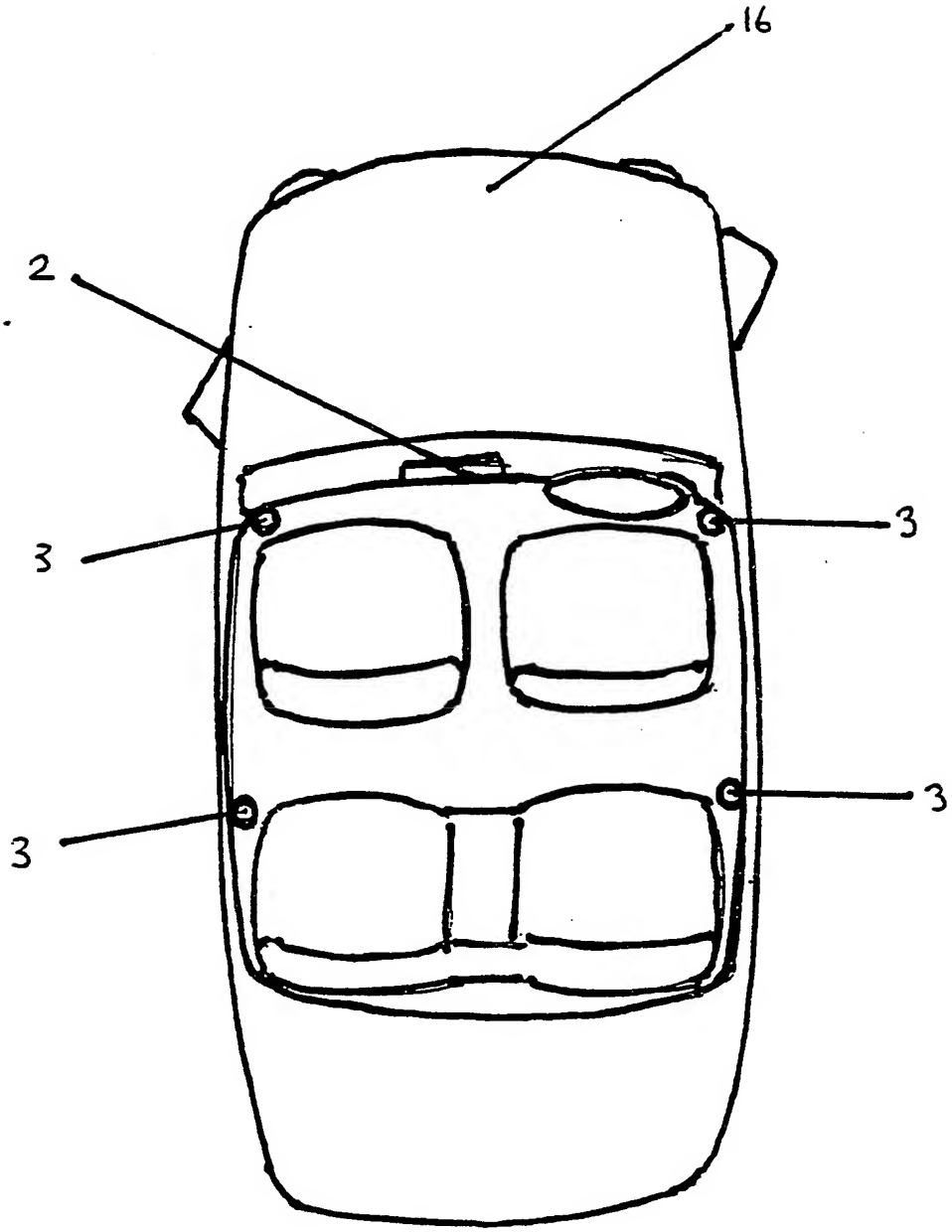

FIG.5.

AN ADAPTOR FOR AN AUDIO SYSTEM

This invention relates to an adaptor for an audio system, for instance an audio system installed within a motor vehicle, to enable the audio system to be used as a communication system. The invention also relates to audio apparatus adapted to be used as a communication system.

Communication systems are available for specialised usage such as communication between motorcycle rider and pillion passenger, and between the driver and co-driver of rally cars. Such systems are purpose built and independent from other systems within the vehicle.

There remains a need for improving communication within vehicles, particularly between the driver (or front seat passenger) and rear seat passengers. As the driver and front seat passenger face away from the rear seat passengers their speech is directed towards the front of the vehicle making it very difficult for rear seat passengers to hear them over the engine noise or road noise of the vehicle. The situation if further exacerbated by the use of rear seat belts which inhibit the rear seat passengers from leaning forward to converse with the driver or front seat passenger.

Thus, according to a first aspect of the invention, there is provided an adaptor for use with an audio system to enable the audio system to be used as a communication system, the adaptor comprising: a microphone; an electronic circuit; power connection means for connecting the electronic circuit to a power source; and connector means for connecting an output of the electronic circuit to an input of an audio system, the arrangement being such that when the adaptor is connected to a power source and an audio system, sound picked-up by the microphone is transmitted through the speakers of the audio system.

According to a second aspect of the invention, there is provided audio apparatus adapted to be used selectively as an audio system for

playing recorded or broadcast sounds or as a communication system, the apparatus comprising one or more speakers and one or more microphones and being arranged such that when used as an audio system the recorded or broadcast sounds are played through the said speaker(s) and when used as a communication system sound picked-up by the said microphone(s) is transmitted through the said speaker(s). The apparatus may be an audio system mounted within a motor vehicle.

Other features of the invention will be apparent from the following description and from the subsidiary claims of the specification.

The invention will now be further described, merely by way of example, with reference to the accompanying drawings, in which:

Figure 1(A) is a perspective view of an adaptor according to a first embodiment of the invention together with an audio system and Figure 1(B) is a side view of the adaptor;

Figure 2(A) is a perspective view of an adaptor according to a second embodiment of the invention together with an audio system and Figure 2(B) is a side view thereof;

Figure 3 is a perspective view of an adaptor according to a third embodiment of the invention together with an audio system;

Figure 4 is a perspective view of an adaptor according to a fourth embodiment of the invention shown connected to an audio system of a motor vehicle; and

Figure 5 is a diagrammatic plan view of an embodiment of audio apparatus according to the second aspect of the invention installed in a motor vehicle.

The adaptor to be described is designed for use with an audio system such as that installed in a motor vehicle, eg a car. The audio system,

may comprise a conventional cassette or radio/cassette player or any combination thereof. By making use of the existing audio system, there is no need to install any additional components or wiring apart from the adaptor itself. The device is thus readily portable from one audio system to another.

Although the adaptor will work with an audio system having a single speaker, it is preferable that the system has more than one speaker; a typical arrangement being a system which has one or more speakers in the front of the car and one or more in the rear.

By simply installing the adaptor into the existing audio system, the system can be used as a communication system, whereby at least the voices of a driver or passenger in the front seats of the vehicle are amplified by the audio system's amplifier and transmitted through the audio system's speakers. It will be appreciated that this greatly improves communication between the front and rear of the vehicle, particularly when speakers are provided in the rear compartment of the vehicle.

Figure 1 shows a first embodiment of the adaptor. This comprises a cassette adaptor 1 which is of similar shape to a conventional cassette and can be inserted into the cassette slot of a conventional cassette player 2. The cassette adaptor 1 carries a microphone 3, electronic circuitry 4 and a battery 5. The arrangement is such that when the cassette adaptor 1 is fitted within the cassette slot of the audio system 2, sounds picked up by the microphone 3 are amplified by the circuitry 4 and the output of the circuitry 4 is transmitted to the tape pick-up of the audio system 2. This method of using the tape pick-up is known from a conventional system in which a compact disc adaptor is inserted into the cassette slot to act as an input for a CD player and the circuitry provided in the cassette part of the adaptor (1) may be same as that used in the known compact disc adaptor. The battery 5 provides the necessary power for the microphone 3 and the electric circuitry 4. The audio system 2 then operates as normal but instead of playing sounds recorded on a cassette through its speakers, it plays

sounds picked up by the microphone 3 and transmitted thereto through the cassette adaptor 1. The volume, tone, balance controls etc of the audio system 2 thus function as usual.

The circuitry 4 may simply comprise an amplifer to convert the low level signals received from the microphone 3 into a format suitable for interfacing with the adapter 1 and/or the tape pick-up of the audio system 2. The circuitry 4 and that provided in the cassette part of the adaptor (1) may, if desired, be combined.

Preferably, the microphone 3 is rotatably mounted on the cassette adaptor 1 so that it can be moved between an extended position as shown in Figure 1(A) and folded back to a storage position so the adaptor can be stored in a compact casing 6 as shown in Figure 1(B).

Figure 2 shows a second embodiment of the adaptor. This is similar to that shown in Figure 1 except that the microphone 3, electronic circuitry 4 and battery 5 are housed in a fixed mounting attached to one end of the cassette adaptor 1.

Figures 1 and 2 relate to systems in which the cassettes are loaded end first into a cassette slot. Other forms of adaptor may be provided for audio systems having other types of cassette receiving mechanism.

Figure 3 shows a third embodiment of the adaptor. In this case, the adaptor comprises a plug 7 for fitting within a pick-up socket 8 of the audio system 2, e.g. a compact disc player input as provided on some systems. The plug 7 is mounted on one end of a cylindrical casing 9 which houses the electronic circuitry 4 and battery 5. On the other end of the casing 9 is an arm 10 which is preferably flexible and carries the microphone 3 at its far end.

The arrangement shown in Figure 3 operates in a similar manner to that shown in Figure 1 in that sounds picked up by the microphone 3 are amplified by the circuitry 4 and transmitted to the compact disc

player input socket 8 so the audio system 2 'plays' the sounds picked up by the microphone rather than signals received from a CD player. This form of direct input through an input socket 8 of the audio system, rather than an indirect input via a cassette adaptor 1 as described above reduces the complexity of the electronic circuitry required to amplify the signals received from the microphone 3 and convert them into a form compatible with the relevant pick-up of the audio system 2.

Figure 4 shows a fourth embodiment of the adaptor. This also uses a plug 7 which fits into the CD player pick-up socket 8 but in this case, the microphone 3 and circuitry 4 are remote from the audio system and are housed within a unit 11 which may, for instance, be mounted on the dashboard 12 of the vehicle. The unit 11 is simply connected to the plug 7 by wires 13. Also, instead of being powered by a battery, the unit 10 is connected to a plug 14 of known type which fits into a cigar lighter socket 15 of the vehicle. This arrangement is particularly suited to vehicles in which the audio system 2 is mounted in a low position which would not be a suitable location for a microphone to pick up the voices of the driver and/or front seat passenger.

It will be appreciated that the other embodiments described above may also be modified in a similar manner so the microphone 3 can be remotely positioned and/or the adaptor 1 powered via a cigar lighter socket 15 or via some other power source.

The system described above may be used in a wide range of applications, eg, to provide communication between the front and rear seats of a car, to provide communication between the front and rear seats of space waggons, minibuses or other vehicles having more than one row of rear seats, to provide communication between the front and rear compartments of a vehicle, eg a taxi-cab, an ambulance or police vehicle, or to provide communication between a driver and front seat passenger in a noisy vehicle such as a lorry.

In another form of the system described above, one or more microphones may be built into the audio system 2 or vehicle by the manufacturer and the system provided with an additional control to switch over from its normal functions to act as a communication system. Audio apparatus is thus provided which may be used selectively as an audio system for playing recorded or broadcast sound or as a communication system. As in the arrangement described above, the same speakers, and preferably but not necessarily, the same amplifier, would be used by each system to minimise the additional components and wiring required.

As illustrated in Figure 5, the microphones 3 may be installed in the vehicle 16 in appropriate locations to pick-up the voices of the various passengers and the driver. In particular, microphones 3 may be provided to pick-up the voices of rear seat passengers particularly in vehicles having more than one row of rear seats or in which the rear seats do not face forwards.

With such an arrangement, the apparatus 2 may also be designed to provide automatic muting of the radio, tape, CD player etc when a voice is picked up by one of the microphones.

Although the above description relates to the use of the adaptor with an audio system installed in a motor vehicle, it will be appreciated that a similar form of adaptor may be used with other audio systems, eg with a domestic hi-fi system or with a portable cassette player. With a domestic hi-fi system, for example, the adaptor may be used to enable the hi-fi system to be used as a communication system, eg for providing communication from one room of a house to another room. With a portable cassette player, the adaptor may be used to enable the player to be used as a public address system.

CLAIMS

1. An adaptor for use with an audio system to enable the audio system to be used as a communication system, the adaptor comprising: a microphone; an electronic circuit; power connection means for connecting the electronic circuit to a power source; and connector means for connecting an output of the electronic circuit to an input of an audio system, the arrangement being such that when the adaptor is connected to a power source and to an audio system, sound picked-up by the microphone is transmitted through the speakers of the audio system.

2. An adaptor as claimed in claim 1 in which the connector means comprises a cassette adaptor which can be inserted into a conventional audio system in place of a conventional cassette, the microphone and electronic circuit being connected to the cassette adaptor and the arrangement being such that, in use, the output of the electronic circuit is transmitted through the cassette adaptor to a cassette pick-up of the audio system.

3. An adaptor as claimed in claim 2 in which the microphone is movably mounted on the cassette adaptor such that it can be moved between an extended position and a storage position.

4. An adaptor as claimed in claim 1, 2 or 3 in which the connector means comprises a plug for connecting into a pick-up socket of an audio system, e.g. a compact disc pick-up socket.

5. An adaptor as claimed in any preceding claim in which the microphone is arranged for location in a position remote from the audio system.

6. An adaptor as claimed in any preceding claim in which the microphone is mounted on a multi-directional support so the microphone can be positioned in a variety of orientations.

7. An adaptor as claimed in any preceding claim in which the power connection means comprises a battery socket for receiving a battery.

8. An adaptor as claimed in any preceding claim in which the power connection means comprises a plug for connecting to a remote power source, e.g. a cigar lighter socket of a motor vehicle.

9. An adaptor as claimed in any preceding claim when connected to an audio system, eg an audio system fitted within a motor vehicle.

10. An adaptor as claimed in claim 9 connected to an audio system fitted within a motor vehicle in which the microphone is positioned to pick-up voices of passengers in the front seats of the motor vehicle so that their voices are transmitted through speakers of the audio system in other parts of the vehicle, e.g. to passengers in the rear seats of the motor vehicle.

11. An adaptor for use with an audio system substantially as hereinbefore described with reference to the accompanying drawings.

12. Audio apparatus adapted to be used selectively as an audio system for playing recorded or broadcast sounds or as a communication system, the apparatus comprising one or more speakers and one or more microphones and being arranged such that when used as an audio system the recorded or broadcast sounds are played through the said speaker(s) and when used as a communication system sound picked-up by the said microphone(s) is transmitted through the said speaker(s).

13. Audio apparatus as claimed in claim 12 comprising an amplifier arranged to amplify sound transmitted through the speakers both when the apparatus is used as an audio system and when it is used as a communication system.

14. Audio apparatus as claimed in claim 12 or 13 mounted within a motor vehicle.

15. Audio apparatus as claimed in claim 14 arranged such that the voice of a person in a front seat of the vehicle can be transmitted through speakers located near a rear seat of the vehicle.

16. Audio apparatus as claimed in claim 14 or 15 arranged such that the voice of a person in a rear seat of the vehicle can be transmitted through speakers located near a front seat of the vehicle.

17. Audio apparatus adapted to be selectively used as an audio system for playing recorded or broadcast sound or as a communication system substantially as hereinbefore described with reference to the accompanying drawings.

Patents Act 1977
Examiner's report to the Comptroller under Section 17 (The Search Report)

Application number
GB 9315369.0

Relevant Technical fields

(i) UK Cl (Edition L) H4J (JA JAX JGF JGX)
G5R (RGA RAC)

(ii) Int Cl (Edition 5) G11B 31/00

Search Examiner
P J EASTERFIELD

Databases (see over)

(i) UK Patent Office

(ii) ONLINE DATABASES: WPI

Date of Search
17 SEPTEMBER 1993

Documents considered relevant following a search in respect of claims

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
X	EP 0223529 A2 (RECOTON) see page 3 lines 11-18	1-3,9, 12-14
X	WO 90/09655 A1 (LOTUS) whole document	12-16
X	US 4034164 A (WESTMOLAND) whole document	1-3, 5, 12-14
X	US 3978524 A (GORDON ET AL) whole document	1-3, 5, 12, 13
X	US 3946156 A (BUDROSE) whole document	1-3, 5 12, 13

Category	Identity of document and relevant passages	Relevant to claim

Categories of documents

X: Document indicating lack of novelty or of inventive step.

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